

**REMARKS**

Claims 1–20 are pending in the present application. Claims 1–7 have been withdrawn from consideration, but not cancelled.

Claims 8 and 16 have been amended.

Reconsideration of the claims is respectfully requested.

**35 U.S.C. § 102 (Anticipation)**

Claims 16–18 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,175,154 to *Gillespie*. Claims 8–14 and 16–18 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,103,625 to *Marcy et al.* These rejections are respectfully traversed.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. MPEP § 2131; *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). Anticipation is only shown where each and every limitation of the claimed invention is found in a single prior art reference. MPEP § 2131; *In re Donohue*, 766 F.2d 531, 534, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985).

Independent claim 16 recites that the protective barrier layer overlies the tungsten and be disposed within the opening. Such a feature is not shown in the cited reference. *Gillespie*

teaches that the tungsten 9 fills the opening, such that the overlying titanium nitride layer 11 is above the opening rather than within the opening.

Independent claims 8 and 16 recite that the protective barrier layer is formed of a material for which chemical mechanical polishing is primarily mechanical (rather than primarily chemical). Such a feature is not shown or suggested by the cited reference. To reduce dishing, *Marcyk et al* relies on the difference in height for the polish stop layer 208 or 308 over the high areas 208a or narrow features 304a versus over the low areas 208b or wide features 206b/304b. *Marcyk et al*, column 4, lines 33–56 and column 5, lines 32–56. *Marcyk et al* does not teach or suggest selecting a material for polish stop layer 208 or 308 based on whether chemical mechanical polishing for that material is primarily mechanical. In fact, *Marcyk et al* teaches that tungsten (W) may be a suitable material for polish stop layer 208. *Marcyk et al*, column 4, lines 17–21. As disclosed in the specification, chemical mechanical polishing for tungsten is primarily chemical. Specification, page 12, lines 2–6.

Therefore, the rejections of claims 8–14 and 16–18 under 35 U.S.C. § 102 have been overcome.

**35 U.S.C. § 103 (Obviousness)**

Claims 15 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Marcyk et al* in view of U.S. Patent No. 6,346,741 to *Van Buskirk et al*. This rejection is respectfully traversed.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second,

there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142.

As noted above, independent claims 8 and 16 recite features not shown or suggested by *Marcy et al.* Such features are also not taught or suggested by *Van Buskirk et al.*

Therefore, the rejection of claims 15 and 20 under 35 U.S.C. § 103 has been overcome.

**AMENDMENTS WITH MARKINGS TO SHOW CHANGES MADE**

Claims 8 and 16 were amended herein as follows:

1     8. (amended) A portion of an integrated circuit structure comprising:

2             a dielectric layer over a substrate;

3             a conformal tungsten layer over the dielectric layer and within openings within the  
4     dielectric layer; and

5             a protective barrier layer over the tungsten layer and within the openings, wherein the  
6     protective barrier layer comprises a material for which removal by chemical mechanical  
7     polishing is primarily mechanical.

1     16. (amended) A portion of an integrated circuit structure comprising:

2             a dielectric layer having an opening therein;

3             tungsten within the opening; and

4             a portion of a protective barrier layer over a central region of the tungsten and within the  
5     opening, wherein the portion of the protective barrier layer comprises a material for which  
6     removal by chemical mechanical polishing is primarily mechanical.

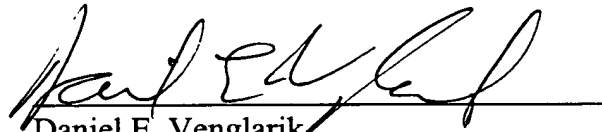
If any issues arise, or if the Examiner has any suggestions for expediting allowance of this Application, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at *dvenglarik@davismunck.com*.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

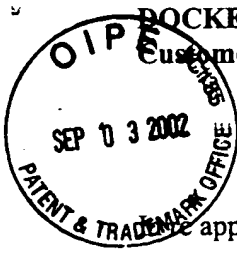
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Date: 8-27-02

  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: : CHARLES R. SPINNER, III ET AL  
Serial No. : 09/871,463  
Filed : May 31, 2001  
For : BARRIER FILM DEPOSITION OVER METAL FOR  
REDUCTION IN METAL DISHING AFTER CMP  
Group No. : 2815  
Examiner : M.E. Warren

**BOX NON-FEE AMENDMENT**  
Commissioner for Patents  
Washington, D.C. 20231

**CERTIFICATE OF MAILING BY FIRST CLASS MAIL**

Sir:

The undersigned hereby certifies that the following documents:

1. Amendment and Response to Office Action;
2. Proposed Drawing Changes (w/redlined drawing FIGS. 3A, 3B and 3C); and
3. A postcard receipt;

relating to the above application, were deposited as "First Class Mail" with the United States Postal Service, addressed to Box NON-FEE AMENDMENT, Commissioner for Patents, Washington, D.C. 20231, on August 27, 2002.

Date: 8/27/02

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